Does Immigration Stimulate Non-Traditional Exports? Evidence from Zambia

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Abstract
This paper investigates the effect of immigration on trade flows using Zambia as a case study. Using panel data for the period 1990-2018, the relationship is formulated using a gravity model and estimated using the Poisson Pseudo Maximum Likelihood Estimation (PPML). The model estimated the influence of immigration on total trade, imports and non-traditional exports (NTEs), while controlling for whether or not the trade partner has a trade agreement with Zambia. The results show a positive association between immigration and total trade, imports and NTEs. It points to the importance of social networks in fostering trade flows across countries and that trade costs matter.

Key Words: Gravity model, Immigration, PPML, Trade, Zambia.
JEL Classification Code: F0, F1, F6.

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1. Introduction

Zambia has focused its trade policy on growing the economy through the promotion and diversification of its exports. It has implemented various policies and actions to increase exports, especially non-traditional exports (NTEs). Increased trade has potentially been made easier through the several multilateral and regional preferential trade agreements that the country has and continues to sign. These agreements are aimed at lowering or eliminating trade barriers to increased trade. However, intractable trade barriers still inhibit trade flows. To resolve these barriers, traders create social networks, through such vehicles as immigrant communities, to acquire specific information about trade opportunities, economic, social and political conditions in the relevant export markets. They pursue information on rules and legislation, and norms of business behaviour, culture and language. The use of this information tends to lower transaction costs and increase trade (Hatzigeorgiou, 2010; Rauch & Trindade, 2002; Dastidar & Balasubramanyam, 2015; Metulini et al., 2004). The lack of such information could most likely hinder efforts to stimulate and create trade (Rauch & Casella, 2003).

Immigrant networks influence trade in several ways. They stimulate a country's preferences. As immigrants settle, adapt and form communities, their consumer choices may change. Immigrant communities may form productive units that produce goods that are in demand in their countries of origin. This raises exports and positively contributes to the host country's economy (Genc, 2014; Taio, 2009; Rauch & Casella, 2003; Egger & Lassmann, 2015). Immigrants' knowledge of their country of origin tends to facilitate exports. It helps traders in the host country to understand the export market in their countries of origin (Aleksynska & Peri, 2012; Hutchinson and Dunlevy, 2001; Artal-Tur, 2015). The second generation of immigrants, that is frequently bilingual, may assist the host country in trade talks with their parents' countries of origin (Blanes-Cristobal, 2008).

The degree of responsiveness of exports and imports to changes in immigrant stocks varies among countries because of differences in trade and immigration policies (Hatzigeorgiou, 2010). Many developing countries have various trade and non-trade barriers that protect their nascent manufacturing industries. These barriers tend to inhibit the development of competitive export industries. They raise trade costs. To build competitive industries and increased trade, one has to strive for low production and trade costs ((UNCTAD, 2016). The existence of high production and trade costs in many developing countries has affected the responsiveness of trade to changes in immigration.

The purpose of this study is to examine the link between immigration and trade flows in a developing country. We use Zambian data to understand the ability of immigrant communities to improve trade flows among countries. The results are interesting for several reasons. Firstly, they add to the empirical evidence for the export-immigration nexus in developing countries. There are a few studies, such as Ehrhart et al. (2014) and Lufuke (2017), that focus on the question whether or not immigration stimulates trade in developing countries. Most other studies focus on emigration to developed countries. For example, Uprety (2017) looks at the impact of trade on emigration from developing countries and finds that high-skilled workers are more likely to emigrate to developed countries with trade. Uprety (2020) further argues that

high – skilled emigrants increase income inequality in their country of origin, while low skilled emigrants do not. Rapport (2016) asserts that migrants contribute to the integration of their home country into the global economy, while Rivera-Batiz (1983) focuses on the income distribution effects of emigration. Our focus is on the trade effects of immigrant communities in Zambia.

Secondly, Zambia is currently involved in discussions on trade and immigration reforms under the African Union. The results would provide insights into the design of potential trade and immigration reforms that would be trade enhancing. The empirical results suggest that immigration improves trade flows. The results are robust and are consistent with previous studies

The rest of the paper is organized as follows. Section 2 looks at immigration and trade flows in Zambia. Section 3 reviews the related literature on the impact of immigration on trade. Section 4 highlights the empirical model adopted for the study. Section 5 discusses the data and the estimation results. We finally conclude the paper in section 6.

2. Immigrants and Trade in Zambia

The influence of immigration on trade in Zambia can be traced to the pre-independence period. The development of the mines on the Copperbelt triggered an inflow of European immigrants into the country. They came as skilled mine workers and commercial farmers. The European population particularly increased between 1911 and 1961 (Baldwin, 1966). The non-European immigration was mostly African. The first comprehensive census to detail African immigration was the 1963 census. It indicated that 6.7% of Zambia's African population was foreign-born (Ohadike, 1974). The African immigrant stock was mainly composed of Malawians, Angolans, Zimbabweans, Mozambicans, Congolese and Tanzanians. Zambia also had a vibrant Asian population that immigrated into the country at almost the same time as the European settlers. This was estimated at 5,450, the year before independence (Ohadike,1974).

After independence, the immigration pattern changed. Zambia, being at the heart of the emancipation of most Southern African countries from minority rule, became a refuge for nationalists from neighbouring countries. Settlers, asylum seekers and economic refugees were integrated into the country (Ohadike, 1974). During the same period, a vast majority of Europeans emigrated because of changes in labour and economic policies (Sow, 2017).

In the 1990s, regional immigrants made up 93.4% of the total immigrant stock. The Indian community formed the largest part of the Asian community. The largest European immigrant community was British. This is demonstrated in table 1.

Table 1: Total Immigrant Stock, 1990-2017 ('000)

Countries	1990	2000	2010	2017
Regional[1]				
Angola	123.78	220.25	37.11	38.93
Botswana	0.47	0.11	0.92	0.96
Burundi	0	1.80	3.24	3.40
Congo DR	27.30	58.24	20.93	21.96
Kenya	0.43	0.25	0.54	0.56
Malawi	17.07	6.94	13.48	14.13
Mozambique	41.26	0.55	1.30	1.36
Namibia	2.,36	0.10	0.63	0.66
Rwanda	0	3.66	7.46	7.83
South Africa	6.33	1.54	3.07	3.22
Tanzania	6.99	4.,32	5.92	6.21
Zimbabwe	34.63	9.06	17.11	17. 95
Total	260.60 (93.39)	306.82 (95.53)	111.69 (74.64)	117.16 (66.98)
Other Countries				
Ghana	0.48	0.17	0.18	0.18
Nigeria	0.16	0.14	0.51	0.53
Uganda	0.35	0.37	0.46	0.48
Australia	0.08	0.08	0.26	0.28
Germany	0.31	0.16	0.28	0.29
India	4.28	3.47	4. 63	4. 86
UK	1.99	1.04	1.29	1.35
USA	0.46	0.46	0.95	0.99
China	0.10	0.17	1.01	1.06
Others	10.21	8.32	28.39	47.75
Total	18.42 (6.60)	14.36 (4.47)	37.95 (25.36)	57.7 (32.98)
Grand Total	279.03	321.18	149.64	174.93

Source: United Nations Population Division, DESA.

1. Regional countries are either members of SADC or COMESA
2. Percentages in parenthesis

Between 1990 and 2000, immigrants from the region continued to dominate in the total immigrant stock. These made up 95.5% of the total stock in 2000. There was, however, a massive repatriation of Mozambicans and South Africans after their countries returned to peace. This reduced their shares in the total immigrant stock. Immigrants from Rwanda and Burundi are a recent phenomenon. Their shares in the total immigrant stock has increased exponentially. The non-African immigrant stock continued to be dominated by Indians and the British.

Between 2000 and 2010, the total immigrant stock declined by 53.41% despite an increase in the number of immigrants from Rwanda, Burundi, Cameroon, Botswana and Namibia. There was also an increase in Chinese immigrants. The total immigrant stock started to increase again between 2010 and 2017. It increased by 4.91%. Immigrants from the region still dominate the stock at about 67%. African countries outside the region with substantial immigrant communities are Nigeria, Mali, and Egypt. The British, Germans and French dominate the European immigrant population. Overall Indians are the largest non-African immigrant community, followed by the Chinese. There are also immigrant populations from countries such as Australia, Canada, and Japan.

Zambia's major export is copper. Currently, copper accounts for over 75% of total exports. Copper production and exports have dominated the economy for the past 80 years (Baldwin, 1966; Sikamo & Mwanza, 2016). Most of Zambia's copper exports are traded through Switzerland. The Swiss trade hubs act as mediators in the trade, by purchasing the commodity from the extracting countries and re-exporting it to the buyers, mostly in China (Dobler & Kesselring, 2019).

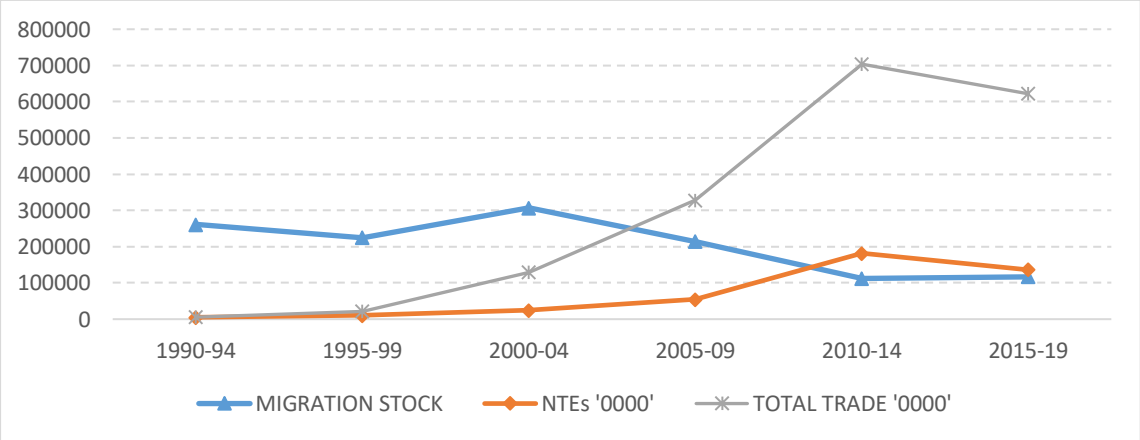

Figure 1: Immigrant Stock, Total Trade and NTEs in the Region, 1990 – 2019
Source: UN Comtrade, United Nations Population Division, DESA.

However, our focus is on NTEs. This is where the potential for export expansion lies and it is government policy to increase NTEs (MNDP, 2017:7). Figure 1 shows the total regional immigrant stocks, NTEs and total trade between Zambia and the regional countries in SADC and COMESA between 1990 and 2019. The trade flows have not always moved consistently with immigration from the region. The reasons for this might be the sporadic outbreaks of civil disorder in some of the regional countries, which caused rapid inflows (1995-1999) and outflows (2000-2010) of immigrants. Post-2014, there has also been a trade and export slump in the region because of droughts, maize bans, reduced electricity generation, increased production costs and generally reduced output.

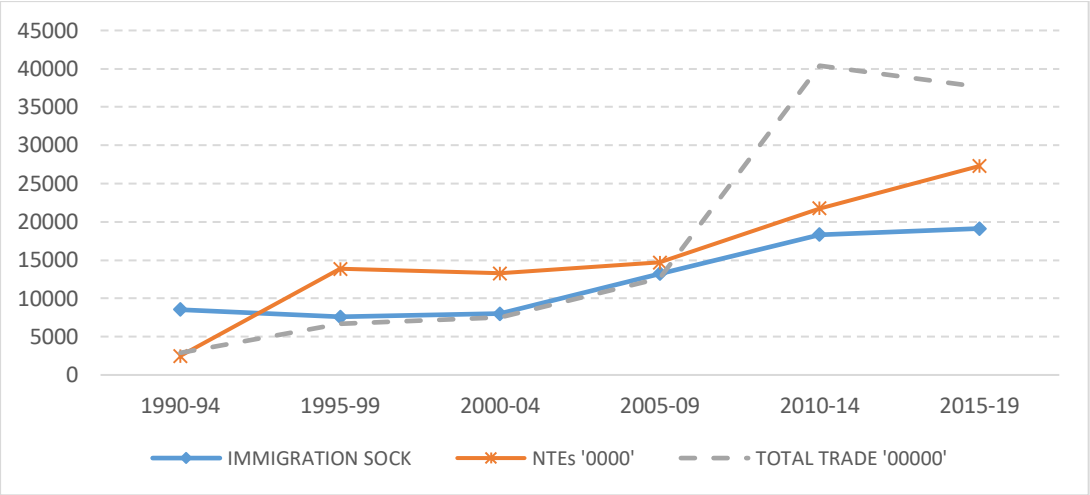

Figure 2: Immigrant Stock, Total Trade and NTE Outside the Region, 1990-2019
Source: UN Comtrade; United Nations Population Division, DESA

Figure 2, shows total trade, NTEs and immigrant stocks for non-regional countries between 1990 and 2019. The pattern here is different. Total trade and NTEs both moved consistently with immigration except for the period between 1994 and 1999 when immigration slightly dropped while total trade and NTEs increased. In the period after 2014, total trade reduced, while immigration and NTEs increased. The fall in total trade was due to the fall in copper prices, drought and electricity deficits that affected national output. Ironically, these adverse conditions seem not to have affected NTEs, which continued to increase.

3. Review of Related Literature

Several theoretical (Genc, 2014; Ma 2014; Gould 1991) and empirical studies (Gould, 1991, 1994; Wagner et al., 2002; Girma and Yu, 2000; Wagner et al., 2002; Dunlevy, 2006; Ehrhart et al., 2012) have explained the relationship between immigration and trade. Two themes are prominent in the theoretical literature. These are the immigrant preference and trade costs effects on trade flows.

Empirical studies show that immigrants influence trade by altering market preferences and trade costs. Immigrants tend to have current information on products from their country of origin in contrast to the limited information about the products in the host country (Borjas 1995; Ma 2014; Gould 1991; Combes et al. 2005; Genc et al. 2011). Immigrants prefer products from their country of origin. This preference for products from their country of origin translates into increased imports (Ma, 2014). Furthermore, as immigrants adapt and assimilate, they start to contribute to national production. The assimilation and the formation of immigrant communities gradually raises exports. The communities formed are identical to target markets. They have characteristics useful to domestic firms' that export to their countries of origin. The knowledge of their countries of origin combined with their access to its market lowers expenses incurred on both imports and exports (Rauch and Trindale, 2003; Aleksynska et al., 2012).

The immigration-trade connection has been widely studied in the literature (Rauch and Trindale, 2003; Aleksynska et al., 2012, Blanes-Cristobal, 2008). Commonly, these studies find a positive relationship between trade and immigration. Blanes- Cristobal (2008) found that immigration has a positive effect on total trade, imports and exports. These results are similar to those obtained on total trade between the USA and Europe (Hutchinson & Dunlevy, 2001). Garmaza (2011), White (2007, 2009) and Mundra (2005) also document a positive immigrant influence on total trade.

White (2009) further observed that the impact of immigration on trade between the USA and developing countries was higher than that between the USA and other developed countries. Blanes (2005) documents a positive effect of immigration on intra-industry trade in Spain. Girma and Yu (2000) found that immigration from countries with a different culture, social and political institutions have a pro-import effect on trade with the UK. On the other hand, immigrants from countries with similar characteristics to the UK had a lesser effect on imports. Their findings also revealed that non-commonwealth immigrants significantly affected imports, whereas those from commonwealth member countries had an insignificant impact.

There have been a few studies on developing countries. Bacarreza et al. (2006) revealed that immigration has a positive impact on trade in Bolivia. That information lowers trade costs and improves exports while immigrants' preference for home products increases imports. The study also showed that the economic status of the immigrants' country of origin affected exports more than imports. In Sub-Saharan Africa, notable studies by Ehrhart et al. (2014) and Lufuke (2017), look at the effect of immigrants on exports in Africa and Tanzania, respectively. Ehrhart et al. (2014) observed that immigration in Africa has a positive influence on exports. They found that every new immigrant creates about US$ 2,800 additional annual exports for the country of origin. Similarly, Lufuke (2017) found a positive relationship between Tanzanian exports and immigration.

Ehrhart et al. (2014) assert that the trade enhancing effect of immigration can partly be explained by the strengths or weaknesses of institutions on the continent. This effect is particularly important for exports of differentiated products. The ineffectiveness of institutions responsible for the promotion of trade increases the importance of immigrants in fostering trade. Immigrant networks, either substitute or complement such institutions. Gamaza (2011) and Ehrhart et al., (2014) observed that social, political, economic, cultural and geographical factors impact trade. In particular, contiguity borders, cultural and ethnolinguistic ties between the host and the country of origin and membership to a regional trade arrangement amplifies trade. On the other hand, high trade costs or distance dampens trade across countries (Genc et al., 2011; Lufuke 2017; Girma and Yu 2000).

The available literature shows that immigration affects trade through the preference and trade cost channels. Immigration lowers transactions costs and alters market preferences. However, there is no study looking at trade and immigration in Zambia. This study will, therefore, contribute to the existing literature and knowledge. It will shed light on the relationship

between immigration and trade. It will also be very relevant to policymakers who are striving to find ways of promoting exports.

4. Empirical Model and Data

Following the work of Tinbergen (1962) and others (Anderson and van Wincoop, 2003), we use the gravity model for our empirical work. The gravity model of trade predicts that international trade between two countries is directly proportional to the product of their sizes and inversely proportional to the trade frictions between them (Yotov et al., 2018; Garmaza, 2011; Gould, 1991; Girma & Yu, 2000; Casi, 2006). The model has had wide success in predicting the relationship of trade flows between countries (Fasih, 2018). The basic gravity model for this study can then be described as;

$$T_{ij} = \frac{Y_{ij}}{D_{ij}} \quad (1)$$

Where T_{ij} is the bilateral trade flow between country i and country j;

Y_{ij} is the economic mass of country *i* and *j*. The economic mass is the product of the two respective countries GDPs; and

D_{ij} is the distance between country *i* and country *j*.

Genc et al. (2011), Piperakiss (2003) and Faustino & Leitao (2008) show that this model has a higher explanatory power for marginal changes in independent variables. The consistent success of the model in explaining different economic flows such as immigration and trade, has promoted its use in analysing trade flows (Fagiolo & Mastrorillo, 2014).

We follow the literature that estimates the effect of immigration stock on trade using the augmented gravity model (Feenstra, 2004; Anderson and van Wincoop, 2004). We include the log of the total stock of immigrants. The structural gravity model equation can, therefore, be estimated as an augmented log-linear equation. The augmented gravity model used to estimate the effect of immigration on trade is specified as:

$$In(T_{ijt}) = \beta_0 + \beta_1 \ln(Y_{ijt}) + \beta_2 \ln(D_{ijt}) + \beta_3 \ln(mig_{ijt}) + \beta_4 comlegal_{ijt} + \beta_5 contiguity_{ijt} + \beta_6 RTA_{ijt} + \beta_7 comlegal_{ijt} + \mathcal{E}_{ijt} \quad (2)$$

$$In(NTE_{ijt}) = \beta_0 + \beta_1 \ln(Y_{ijt}) + \beta_2 \ln(D_{ijt}) + \beta_3 \ln(mig_{ijt}) + \beta_4 comlegal_{ijt} + \beta_5 contiguity_{ijt} + \beta_6 RTA_{ijt} + \beta_7 comlegal_{ijt} + \mathcal{E}_{ijt} \quad (3)$$

$$In(M_{ijt}) = \beta_0 + \beta_1 \ln(Y_{ijt}) + \beta_2 \ln(D_{ijt}) + \beta_3 \ln(mig_{ijt}) + \beta_4 comlegal_{ijt} + \beta_5 contiguity_{ijt} + \beta_6 RTA_{ijt} + \beta_7 comlegal_{ijt} + \mathcal{E}_{ijt} \quad (4)$$

where T_{ij} is total trade between country i and j; NTE_{ij} is NTEs from country i exported to country j; M_{ij} is the total imports from country j by country j; mig is immigrant stock from

country i to country j. *comlan* and *contiguity* are dummies variables for common official language and common border, respectively. While *RTA* and *comlegal* consider the existence of trade agreements and common legal system between country i and j, respectively and $\mathcal{E}_{ijt}$ is the random error term.

Augmenting the gravity model helps to control for multilateral trade resistance and heterogeneity (Ehrhart et al., 2014). Multilateral resistance arises when the effects of other countries on the volume of bilateral trade are incorporated into the analysis (Wolwer et al., 2018). The lack of inclusion of the transaction cost of trade with the rest of the world is the main disadvantage of the gravity model. This failure leads to implausible results and does not allow for comparative analysis (Wolwer et al., 2018). Multilateral Resistance also summarizes the trade resistance (barriers) between the two countries. The binary dummy variables, *RTA and comlegal,* control for multilateral resistance by capturing the relativity of trade costs.

Endogeneity is another problem that is common with trade and migration estimations (Belaid & Slanny, 2018). This is usually due to omitted variables and reversal causality problems. The omitted variables problem is from the theory that underpins the gravity model for trade or migration, where bilateral immigration flows are dependent on the destination and origin country-specific immigration frictions. The reverse causality problem relates to the possibility that a bi-relationship may exist between trade and immigration. To control for endogeneity, we identify and introduce variables that influence bilateral trade only through immigration varying both in time and by country pairs to act as instruments (Magerman, et al., 2016).

We use the Poisson Pseudo Maximum Likelihood (PPML) estimator to estimate our augmented structural gravity model. The PPML takes into account some of the problems that may arise in gravity model estimations, such as heteroscedasticity. It also takes advantage of the information contained in the zero trade flows and ensures that the gravity fixed effects are identical to their corresponding structural terms (Yotov, et al., 2016; Martin and Pham, 2008). Furthermore, the PPML estimator gives us estimated coefficients that make for easy interpretation. The PPML estimator under weak assumptions provides consistent estimates of the original non-linear model. The PPML is equivalent to a non-linear least-squared on the original equation, if the data follows a Poisson distribution (Shepherd, 2013). The PPML provides unbiased estimates and gives equal weight to all observations and a positive mean (Herrera, 2012).

5. Data

The study uses panel data for 30 countries collected from various secondary sources. This covered the period 1990-2018. The trade data, both the volume of imports and exports, were obtained from the United Nations COMTRADE database. The French Research Centre on International Economics (CEPII) was the source for the data on 'distance'- the distance between countries, common languages, and contiguous borders. The economic masses were computed by multiplying Zambia's Gross Domestic Product (GDP) with respective countries' GDPs. The source for the GDP figures was the International Monetary Fund (IMF) database. The source for the regional trade data was the Southern African Development Community (SADC) and the Common Market for Eastern and Southern Africa (COMESA). The data on

immigrant stocks was obtained from the United Nations population division, Department of Economics and Social Affairs. The descriptive statistics of the data is presented in table 2.

Table 2: Descriptive Statistics

VARIABLES	(1) Mean[1]	(2) Min	(3) Max
Migrationstock (units)	7,548 (24,516)	0	220,248
Imports (US$ million)	103.1 (355.8)	0	2,708
Total trade (US$ million)	166.0 (502.6)	0	3,430
Non-traditional exports (US$ million)	29.09 (88.30)	0	725.7
Distance (Km)	4,708 (4,121)	583.8	13,702
Zambiagdp (US$ billion')	12.32 (9.177)	3.355	24.89
Gdps (US$ billion')	1,132 (2,794)	0.855	19,200
Economicmass (US$)	17,879 (57,430)	3.390	455,000
N	174		

Standard deviation in parenthesis

Source: Calculated by authors from Data.

5.2. Robustness

To consistently estimate the trade impact of immigration, there is need to investigate how zero values in the dependent variable affect the performance of the estimators and check for the presence or absence of heteroscedasticity. We do this by firstly, determining if an efficient estimator can accommodate a dependent variable in which zeros are frequent. Secondly, by investigating if the assumption about the structure of the error terms of each estimator holds in the presence of zero trade flows (Kareem, et al., 2016)

Since the PPML model assumes that the model estimates are unbiased in the presence of heteroscedasticity and deals with trade flows with zero values, a Ramsey RESET test was conducted to check the adequacy of the model. The RESET, proposed by Ramsey (1969) is a general misspecification test design to detect omitted variables and inappropriate functional forms (Shukur & Mantalos, 2004). In the analysis, the RESET test established that all the three equations pass the RESET tests. The test proved that the functional form used for the estimations is correct and that the omitted variables do not have a significant influence on the results of the three estimations.

5.3. Empirical Results

Our empirical analysis comprises of three estimations. First, we examine the effects of immigration on NTEs. NTEs refers to all non-copper exports. An increase in NTEs is an important export strategy for Zambia (MNDP, 2017: 7). Second, we assess the effects of immigration on Zambia's total trade. Finally, we analyse the relationship between immigration and total imports. Our results are based on the data that passed the RESET test to prove that the functional form used for the estimations is correct and that the omitted variables do not have a significant effect on the results of the three estimations.

5.3.1. Immigration and Non-Traditional Exports

Table 3: Results of the PPML Estimation for NTEs

	(1)	(2)
VARIABLES	NTEs	NTEs
Lnmig	0.383*	0.314**
	(0.233)	(0.137)
Lnem	0.640***	0.618***
	(0.081)	(0.055)
Lndist	-1.586***	-1.317***
	(0.374)	(0.395)
Comlan		-2.042***
		(0.651)
Contiguity		-0.322
		(0.362)
RTA		1.174*
		(0.664)
Comlegal		1.657***
		(0.461)
Constant	8.232**	6.507
	(4.002)	(4.175)
Observations	172	172
R-squared	0.279	0.323

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Column (1) and (2) in table 3 presents the results of our estimations on NTEs. These are conditioned on the key determinants of trade flows. The results in column 1 are based on the baseline model while those in column 2 take into account the other controls. Immigration is statistically significant at 10% in the baseline model (column 1) and 5% in the adjusted model (column 2). In both models, distance is used as a proxy for bilateral trade cost while economic mass measures the size of the economies. Immigration is included as the key variable of interest. The estimates in the baseline and adjusted model are all statistically significant within acceptable levels and present the expected signs. This is consistent with theory and available evidence.

The results of the effects of immigration stock, distance and economic size on NTEs in the baseline and adjusted models are not qualitatively affected by the changes in the measurement variables. They remain robust, statistically significant and correctly signed. The results show that a 10% increase in the immigrant stock increases NTEs by 3.14% in the adjusted model and 3.83% in the baseline model. This suggests that every new 100 immigrants improve NTEs by approximately between US$3.14million and US$3.83million. These estimates suggest that the immigration-export nexus has an impact on NTEs in Zambia. Our finding that immigrants stimulate non-traditional exports is also in line with empirical findings by Blanes-Cristobal (2006), Ehrhart et al. (2014), and Lufuke (2017) that immigrants can stimulate exports by leveraging on social networks in their home countries.

The dummy variables show that immigrants from countries with a common language have a lower effect than those from countries that speak a different language. Thus, the negative coefficient of language shows that immigrants from countries whose language is distinct have a greater effect on trade than those from English speaking countries. An immigrant from a non-English speaking country is likely to have a greater impact on Zambia's NTEs than one from an English-speaking country. The positive effects of an RTA show that beyond immigration, trade agreements positively affect NTEs. Thus, belonging to the same RTA as the immigrants' host country is likely to increase trade by 223% or by US$ 223.5million for every 100 new immigrants. This may be because immigrants from these countries have an enhanced incentive to trade because of the reduced trade barriers that are created among member countries. Also, immigrants who come from a country that has a common legal system impact trade more than those who come from other countries. Information about their countries legal systems and institutions helps to understand and utilize the 'potential' export markets.

Our outcome that immigration boosts NTEs entails that immigration policy must play a critical role in the development of a diversified export sector. Policymakers will be well advised to make immigration reform a key element in the design of the strategy for economic diversification. When these immigrants integrate in the country, they bring different complementary skills that make a country increase its productivity. They create firms or join domestic firms that use their information to create products for the export market. In the process, diversifying production, and boosting exports.

Immigrants from larger economies usually arrive as part of investors in larger firms that are engaged in export production (Sow, 2017). The new export firms that they might create, mostly owned by South African, European and Asian immigrants, take advantage of the social networks to expand into new markets, grow and diversify local industries.

Furthermore, technological transfers, by the immigrants, has helped to transition the export industry from being dominantly labour intensive to being capital-intensive (UNCTAD, 2006). In Zambia, the exports of medium and high skilled products grew by 54% between 2003 and 2011. This is compared to exports of low skilled labour-intensive products that grew by 19% over the same period (Fessehaie, *et al*., 2015).

5.3.2. Immigration and Total Trade

Table 4: Results of the PPML Estimation for Total Trade and Imports

VARIABLES	(1) Total Trade	(2) Total Trade	(3) Imports	(4) Imports
Lnmig	0.211	0.324***	0.139	0.298**
	(0.206)	(0.120)	(0.236)	(0.120)
Lnem	0.941***	0.782***	1.103***	0.848***
	(0.183)	(0.0821)	(0.230)	(0.0730)
Lndist	-1.923***	-0.937*	-2.468***	-0.960*
	(0.610)	(0.502)	(0.760)	(0.505)
Comlan		-2.309***		-3.415***
		(0.612)		(0.718)
Contiguity		-1.431***		-1.561***
		(0.538)		(0.557)
RTA		2.175***		2.836***
		(0.713)		(0.808)
Comlegal		1.634***		2.811***
		(0.545)		(0.606)
Constant	11.57**	3.793	14.55**	2.685
	(4.883)	(4.840)	(5.742)	(4.816)
Observations	172	172	172	172
R-squared	0.439	0.653	0.486	0.761

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4 shows our estimations of total trade and imports. Our results show a baseline model, column (1) and an adjusted model, column (2) for total trade. The baseline model postulates that immigrant stock does not exert an influence on total trade between Zambia and the country of origin of the immigrant. However, when other factors are accounted for, the impact of immigration on total trade becomes significant. The coefficient for immigration is positive and statistically significant at 5% level of significance for the adjusted model (column 2). This shows that a 10% increase in immigration improves total trade by 3.24%. This implies that for every 100 additional immigrants, total trade will increase by US$3.24million. This positive impact of immigration on trade flows is consistent with previous studies (White (2009) for the UK; Ma (2014) for the Canada; Figueiredo, et al., (2016) for 19 OECD countries and Piperakis, *et al*., (2003)). All these studies assert that immigration exerts a positive and statistically significant influence on trade. Secondly, distance, which is a proxy for bilateral trade cost, is statistically significant and consistent with other studies that postulate that an increase in trade costs dampens trade flows. Economic mass has a positive and significant effect on total trade. This confirms the empirical evidence that improvements in the size of the economy increases trade among countries.

The results in column (1) are robust to the inclusion of other control variables in column (2). The effect is that the value of the coefficient of immigration becomes significant and the trade reducing impact of transport costs and economic mass declines. The adjusted model also reveals that membership to a regional trade arrangement increases trade flows among member countries. Immigrants from both COMESA and SADC member countries have a positive effect on Zambian trade flows. This is consistent with previous studies by Fagiolo & Mastrorillo (2014) for global trade; Fasih (2018); D'Ambroisio & Montresor (2017) for Spanish trade; and Leitao, et al. (2010) for Portuguese trade.

The dummies for contiguity border and official language reveal a negative effect on total trade. This effect might be a result of the influx of asylum seekers in the 1980s, 1990s and early 2000s from neighbouring countries (Nyamazana, et al., 2017). A common language has a greater effect than a common border. This is because it carries the double effect of being an official language in five of Zambia's neighbours, while only spoken by 2% of Zambians (CSO, 2000). An immigrant's ability to speak English in Zambia might not have such a strong influence on trade because of the other native languages that are spoken in the country mostly as first and second languages.

5.3.3. Immigration and Imports

We likewise looked at the relationship between immigrants and imports. We show the estimated results for imports in table 4. We depict the baseline equation in column (5). The results show that immigration has an insignificant effect on imports. When dummy variables are added to equation 6, the effects of immigration become significant. Generally, immigrants do not affect imports unless certain other factors that affect trade and migration are considered. The results show that a 10% increase in the immigration stock increases imports by 2.98% in the adjusted equation. Thus, an additional 100 immigrants will increase imports by US$2.98million. Column 6 also establishes that immigrants from English-speaking countries have a lower effect on imports than those from Non-English speaking countries. Immigration from neighbouring countries has a lesser impact on imports than immigration from other countries.

We similarly found that such factors as having a common legal system and belonging to the same RTA has a positive impact on imports. Immigration affects import trade by taking advantage of the lower cost of imports created by the RTA. This allows for the importation of goods by immigrants from their country of origin.

6. Conclusion and Policy Recommendations.

This paper analysed the impact of immigration on trade flows in Zambia. We used the augmented gravity model. The results obtained for both the baseline and adjusted specification indicate that immigrants exert a positive and significant influence on the exports of goods from Zambia. The results further demonstrate that the impact is greater on NTEs than on total trade flows. The estimations also suggest that the flow of trade is augmented by membership to a regional trade arrangement and the level of economic development. The analysis further postulates that immigrants from English speaking countries tend to reduce total trade and those from non-English speaking countries tend to increase exports and imports. The sharing of a

common legal system and membership to an RTA arrangement improves the effect on both total trade and imports.

The results echo the need for Zambia to have an attractive immigration policy that can attract immigrants who will have a positive effect on NTEs. These immigrants will facilitate investment in new ventures and expose local firms to new markets through social networks. They will act as agents of economic diversification and development. Our findings support the recent immigration reforms in Zambia that allow immigrants to hold dual citizenship of the host country and the country of origin.

The positive impact of immigrants belonging to a common regional trade arrangement with Zambia and those from countries with a similar legal system on NTEs emphasizes the need for Zambia to participate actively in regional trade arrangements as a way of boosting its NTEs. The expansion and integration of regional markets will tend to reduce information costs and non-tariff barriers, boost NTEs and thus improve trade performance. Furthermore, one can argue that regional markets may act as a "nursery market" where the member countries learn to improve on the production efficiency and competitiveness of their products to be able to compete in the global trading system.

These results nurture the argument that policymakers in Zambia could use immigration policy as part of the strategy to boost its export diversification agenda. This is important in the on-going African Continental Free Trade Area integration process that encompasses immigration reforms. Of course, this strategy has to be complemented by other measures that address transport costs. There is also need for more research to better understand the immigration-trade nexus that will promote NTEs. For example, which type of immigrants positively influence trade?

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